

Application/Control Number: 09/877,809
Art Unit: 2632
Applicant: Jay Warren Gardner

I claim:

1. An electric power monitoring system comprising:
a source monitor for measuring momentary power output of an electric source supplying electric power to a power distribution system having at least one electric load;
means for comparing the momentary power output with a reference load capability for the electric source to determine the ability of the electric source to support additional load, and for transmitting load capability data based on the load capability; and
at least one load control for receiving the transmitted load capability data and controlling the supply of power to the at least one corresponding electric load based on the load capability data.
2. The electric power monitoring system of claim 1 wherein the reference load capability is determined based on at least one of a reference surge load and a reference continuous load.
3. The electric power monitoring system of claim 2 wherein the reference surge load or reference continuous load are programmable according to time of day.
4. The electric power monitoring system of claim 1 wherein the source monitor comprises multiple source monitors, and wherein the means for comparing compares the momentary power output with multiple reference load capabilities, and transmits multiple load capability data to respective multiple loads according to unique load identifiers.
5. The electric power monitoring system of claim 1 wherein the reference load is adjusted in accordance with electric source drive capability, electric source efficiency, or predetermined load patterns, during a power source initialization.

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6. The electric power monitoring system of claim 1 wherein the at least one load control comprises an interrupt switch for interrupting the supply of power to the electric load when the transmitted load capability is less than a predetermined level.
7. The electric power monitoring system of claim 6 wherein the interrupt switch interrupts the supply of power for an interrupt time period upon the return of power following a power failure condition.
8. The electric power monitoring system of claim 7 wherein the interrupt time period is set to delays the return of power for a period of time for the purpose of reducing the total sudden load on the main power source at initial power return.
9. The electric power monitoring system of claim 6 wherein the interrupt switch further monitors electric power levels drawn by the at least one electric load and interrupts the supply of power to the electric load when the transmitted load capability is less than the monitored power levels of the at least one electric load.
10. The electric power monitoring system of claim 6 wherein the interrupt switch delays interruption of the supply of power until the electric load has completed an operation cycle.
11. The electric power monitoring system of claim 6 wherein the interrupt switch delays interruption of the supply of power until the electric load has completed an operation cycle if the electric load's continuous load level is substantially equal to a predetermined level of normal operation.
12. The electric power monitoring system of claim 6 wherein the interrupt switch further comprises a signal transmission system that transmits interrupt switch identifier data and interrupt switch status data.

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13. The electric power monitoring system of claim 12 wherein a switch open status is transmitted when the switch is open and wherein a switch closed status is transmitted just prior to closing the switch for transmitting status data when the corresponding electric load is without power and thereby unable to emit any electromagnetic interference that would compromise the interrupt switch status transmission.
14. The electric power monitoring system of claim 1 further comprising a user interface indicating a condition of whether the electric source has sufficient load capability for supplying electrical power to the at least one electric load.
15. The electric power monitoring system of claim 14 wherein the user interface receives and displays data from the at least one load control related to the electric load level.
16. The electric power monitoring system of claim 14 wherein the user interface interprets a first difference in surge load capability in excess of the continuous load capability and compares this difference to a second difference between a start up surge and continuous load of electric load and determines a power level reported to the user on the interface.
17. The electric power monitoring system of claim 12 further comprising a user interface for reporting the interrupt switch status data to a user.
18. The electric power monitoring system of claim 17 wherein the user interface measures the time period an interrupt switch is open and reports data related the time period to a user.

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19. The electric power monitoring system of claim 17 wherein the electric source is a fuel-based generator, wherein the source monitor measures fuel level in a fuel tank for the generator, and wherein fuel data based on the fuel level is provided on the user interface.
20. The electric power monitoring system of claim 19 wherein the user interface measures total electric power consumed by the power distribution system, measures the fuel consumed for generating the power, and presents a cost per energy unit for comparison with current or available utility rates.
21. The electric power monitoring system of claim 1 wherein the at least one load control comprises a variable circuit breaker that adjusts dynamically to the transmitted load capability.
22. The electric power monitoring system of claim 1 wherein the at least one load control comprises an outlet adapter that closes an outlet to an appliance plug when load capability from the electric source is below a predetermined level.
23. The electric power monitoring system of claim 1 wherein the load capability is determined based on a reference output intended to reduce power consumption during peak load or reduced power conditions.
24. An electric power monitoring system comprising:
 - a source monitor for measuring momentary power output of an electric source supplying electric power to a power distribution system having at least one electric load;
 - means for comparing the momentary power output with a reference load capability for the electric source to determine the ability of the electric source to support additional load, and for transmitting load capability data based on the load capability; and

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a multiplicity of load controls comprised of interrupt switches for interrupting and returning the supply of power to the electric load;

means for each interrupt switch to execute an independent decision process to return power to corresponding loads in sequential order based on a corresponding sequence number, a common time increment, the magnitude of the corresponding supported load and the transmitted load capability data.

25. An electric power monitoring system of claim 24 where in the interrupt switches return power to a load out of sequence when that load is the first load in the sequence that is less than the load capability reported in an increase in the load capability data.
26. An electric power monitoring system of claim 24 where in an initial time interval is added to the method, where in this initial time interval begins at the time a reported load capability increases, and is used by the interrupt switches to allow predominantly low priority loads that have had power to their loads interrupted for a time greater than or equal to a predetermined time, to return power to their loads ahead of higher priority loads.
27. An electric power monitoring method comprising:
- a source monitor for measuring momentary power output of an electric source supplying electric power to a power distribution system having at least one electric load;
 - means for comparing the momentary power output with a reference load capability for the electric source to determine the ability of the electric source to support additional load, and for transmitting load capability data based on the load capability; and
 - at least one load control for receiving the transmitted load capability data and controlling the supply of power to the at least one corresponding electric load based on the load capability data

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28. The electric power monitoring method of claim 27 wherein the reference load capability is determined based on at least one of a reference surge load and a reference continuous load.
29. The electric power monitoring method of claim 28 wherein the reference surge load or reference continuous load are programmable according to time of day.
30. The electric power monitoring method of claim 27 wherein the source monitor comprises multiple source monitors, and wherein the means for comparing compares the momentary power output with multiple reference load capabilities, and transmits multiple load capability data to respective multiple loads according to unique load identifiers.
31. The electric power monitoring method of claim 27 wherein the reference load is adjusted in accordance with electric source drive capability, electric source efficiency, or predetermined load patterns, during a power source initialization.
32. The electric power monitoring method of claim 27 wherein the at least one load control comprises an interrupt switch for interrupting the supply of power to the electric load when the transmitted load capability is less than a predetermined level.
33. The electric power monitoring method of claim 32 wherein the interrupt switch interrupts the supply of power for an interrupt time period upon the return of power following a power failure condition.
34. The electric power monitoring method of claim 33 wherein the interrupt time period is set to delay the return of power for a period of time for the purpose of reducing the total sudden load on the main power source at initial power return.

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35. The electric power monitoring method of claim 32 wherein the interrupt switch further monitors electric power levels drawn by the at least one electric load and interrupts the supply of power to the electric load when the transmitted load capability is less than the monitored power levels of the at least one electric load.
36. The electric power monitoring method of claim 32 wherein the interrupt switch delays interruption of the supply of power until the electric load has completed an operation cycle.
37. The electric power monitoring method of claim 32 wherein the interrupt switch delays interruption of the supply of power until the electric load has completed an operation cycle if the electric load's continuous load level is substantially equal to a predetermined level of normal operation.
38. The electric power monitoring method of claim 32 wherein the interrupt switch further comprises a signal transmission method that transmits interrupt switch identifier data and interrupt switch status data.
39. The electric power monitoring method of claim 38 wherein a switch open status is transmitted when the switch is open and wherein a switch closed status is transmitted just prior to closing the switch for transmitting status data when the corresponding electric load is without power and thereby unable to emit any electromagnetic interference that would compromise the interrupt switch status transmission.
40. The electric power monitoring method of claim 27 further comprising a user interface indicating a condition of whether the electric source has sufficient load capability for supplying electrical power to the at least one electric load.

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41. The electric power monitoring method of claim 40 wherein the user interface receives and displays data from the at least one load control related to the electric load level.
42. The electric power monitoring method of claim 40 wherein the user interface interprets a first difference in surge load capability in excess of the continuous load capability and compares this difference to a second difference between a start up surge and continuous load of electric load and determines a power level reported to the user on the interface.
43. The electric power monitoring method of claim 38 further comprising a user interface for reporting the interrupt switch status data to a user.
44. The electric power monitoring method of claim 43 wherein the user interface measures the time period an interrupt switch is open and reports data related to the time period to a user.
45. The electric power monitoring method of claim 43 wherein the electric source is a fuel-based generator, wherein the source monitor measures fuel level in a fuel tank for the generator, and wherein fuel data based on the fuel level is provided on the user interface.
46. The electric power monitoring method of claim 45 wherein the user interface measures total electric power consumed by the power distribution system, measures the fuel consumed for generating the power, and presents a cost per energy unit for comparison with current or available utility rates.
47. The electric power monitoring method of claim 27 wherein the at least one load control comprises a variable circuit breaker that adjusts dynamically to the transmitted load capability.

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48. The electric power monitoring method of claim 27 wherein the at least one load control comprises an outlet adapter that closes an outlet to an appliance plug when load capability from the electric source is below a predetermined level.
49. The electric power monitoring method of claim 27 wherein the load capability is determined based on a reference output intended to reduce power consumption during peak load or reduced power conditions.
50. An electric power monitoring method comprising:
a source monitor for measuring momentary power output of an electric source supplying electric power to a power distribution system having at least one electric load;
means for comparing the momentary power output with a reference load capability for the electric source to determine the ability of the electric source to support additional load, and for transmitting load capability data based on the load capability; and
a multiplicity of load controls comprised of methods for interrupting and returning the supply of power to the electric load;
means for each method to execute an independent decision process to return power to corresponding loads in sequential order based on a corresponding sequence number, a common time increment, the magnitude of the corresponding supported load and the transmitted load capability data.
51. An electric power monitoring method of claim 50 where in the method for interrupting and returning power to a load, returns power out of sequence when that load is the first load in the sequence that is less than the load capability reported in an increase in the load capability data.
52. An electric power monitoring method of claim 50 where in an initial time interval is added to the method, where in this initial time interval begins at the

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time a reported load capability increases, and is used by the interrupt switches to allow predominantly low priority loads that have interrupted power to their loads for a time greater than or equal to a predetermined time, to return power to their loads ahead of higher priority loads.